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READINESS OF VIRTUAL REALITY IMPLEMENTATION IN MALAYSIAN BUSINESS EVENTS

Izura Ibrahim*, Hafizah Besar Sa'aid[2], Nurfaznim Shuib[3]

[1] Faculty of Business and Management, Universiti Teknologi MARA, Selangor, MALAYSIA
Email: izuraibrahim@uitm.edu.my
[2] Faculty of Business and Management, Universiti Teknologi MARA, Kedah, Malaysia
Email: fizah598@uitm.edu.my
[3] Faculty of Business and Management, Universiti Teknologi MARA, Kedah, Malaysia
Email: nurfaznim@uitm.edu.my
* Corresponding Author

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Abstract:

This concept paper examines Malaysia's readiness to adopt Virtual Reality (VR) in the Meetings, Incentives, Conventions, and Exhibitions (MICE) industry. Drawing on a comprehensive review of literature and the Technology-Organization-Environment (TOE) framework, the study explores the opportunities and challenges of VR adoption in the Malaysian business events context. Key dimensions considered include technological infrastructure, digital literacy, organizational preparedness, and regulatory support. The analysis highlights potential barriers such as high implementation costs, limited skills in immersive technologies, and uneven digital access, while also identifying enablers such as strong government initiatives under Industry 4WRD and increasing digital transformation efforts. As a conceptual contribution, this paper proposes a framework for assessing VR readiness in the MICE sector, providing a theoretical basis for future empirical studies. Practically, it offers insights for policymakers, industry stakeholders, and event organizers to design strategies that enhance Malaysia's global competitiveness in the digital events landscape.

Keywords:

Virtual Reality, Business Events, MICE Industry, Digital Readiness, Malaysia

Introduction

The integration of Virtual Reality (VR) into business events has emerged as a transformative innovation within the global Meetings, Incentives, Conventions, and Exhibitions (MICE) industry. By offering immersive experiences, VR has the potential to redefine event delivery,

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enhance participant engagement, and extend accessibility beyond physical limitations (Hutson & Hutson, 2024). The accelerated digitalization during the COVID-19 pandemic further demonstrated the necessity of adopting advanced technologies to sustain business continuity and competitiveness in the events sector (Amankwah-Amoah, et al., 2021). In this context, VR is increasingly regarded not merely as a supplementary tool, but as a strategic enabler of innovation and value creation in business events.

Malaysia, positioned as a growing hub for MICE activities in the Asia-Pacific region, faces both opportunities and challenges in this technological transition. On the one hand, government initiatives such as Industry4WRD, along with investments from agencies like the Malaysia Digital Economy Corporation (MDEC) and the Malaysian Investment Development Authority (MIDA), demonstrate a favourable policy environment for digital adoption (Malaysian Investment Development Authority (MIDA), n.d.; Malaysia Digital Economy Corporation (MDEC), n.d., 2024). On the other hand, challenges such as uneven digital infrastructure, limited expertise in immersive technologies, and concerns over cost and return on investment pose barriers to widespread VR implementation (Wee, at al., 2022).

Although existing research on VR adoption in tourism and hospitality has highlighted its potential to improve customer experiences, inclusivity, and sustainability (Peštek & Sarvan, 2020; Calisto & Sarkar, 2024; Azhar et al., 2024). limited attention has been given to the readiness of the Malaysian MICE industry specifically. Most studies in Malaysia have focused on VR for tourism and heritage promotion (Fauzi et al., 2022). While global reviews recognize VR's potential in event management, they highlight the lack of systematic frameworks (Efanga, et al., 2024). Within Malaysia's business events sector, research on virtual tradeshows also identifies conceptual gaps (Esam et al., 2025) Addressing this gap is crucial, as the competitiveness of Malaysia's MICE industry increasingly depends on its ability to leverage advanced digital tools.

To guide this exploration, this paper adopts the Technology-Organization-Environment (TOE) framework, which provides a holistic lens to assess readiness by considering technological capacity, organizational preparedness, and external environmental factors. This conceptual foundation enables the development of a framework for evaluating Malaysia's readiness to embrace VR in business events, serving both academic inquiry and practical strategy formulation.

Research Objectives and Scope

The objectives of this concept paper are:

1. To examine Malaysia's technological infrastructure and digital literacy in relation to VR adoption in the MICE industry.
2. To explore organizational preparedness, including skills, resources, and cultural attitudes towards VR integration.
3. To analyze the external environment, focusing on regulatory frameworks, government initiatives, and industry support for VR adoption.
4. To propose a conceptual framework, grounded in the TOE model, for assessing VR readiness in Malaysia's business events sector.

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The scope of this paper is limited to a conceptual exploration based on secondary data and literature published between 2020 and 2025. The focus is specifically on Malaysia's MICE industry, with insights drawn from related studies in tourism, hospitality, and event management. By delineating the technological, organizational, and environmental dimensions of readiness, this paper seeks to provide a foundation for future empirical studies and strategic interventions.

Literature Review

The adoption of Virtual Reality (VR) within the tourism, hospitality, and events industries has attracted increasing scholarly attention in recent years, particularly in the wake of accelerated digitalization during and after the COVID-19 pandemic. Researchers have examined VR from multiple perspectives, ranging from its ability to enhance user experiences and influence behavioral intentions, to its role in supporting hybrid event models and sustainability goals. While much of the literature demonstrates VR's potential as a disruptive innovation, significant gaps remain regarding how emerging economies such as Malaysia can systematically assess their readiness for adoption. To frame this study, the following review synthesizes existing research into five thematic areas: (i) VR applications in tourism, hospitality, and business events, (ii) hybrid and virtual event models, (iii) determinants of VR adoption, (iv) Malaysia's policy and environmental readiness, and (v) practical lessons for MICE stakeholders. These themes not only highlight the breadth of current scholarship but also underscore the need for a comprehensive framework, such as the Technology-Organization-Environment (TOE) model which to evaluate Malaysia's readiness for VR integration.

Virtual Reality in Tourism, Hospitality, and Business Events

Virtual Reality (VR) has progressed from being a novel technology to an increasingly integral tool across tourism, hospitality, and event management. In tourism and hospitality, VR allows potential visitors to experience destinations and services before travel, enhancing destination image, customer trust, and booking intention. Recent reviews confirm that VR consistently improves engagement and decision-making outcomes, though clearer design guidance for practitioners is still needed (Calisto & Sarkar, 2024). Empirical studies reinforce these findings: VR-based previews strengthen tourists' perceptions of authenticity and enjoyment, which in turn increase intention to visit (Anaya-Sánchez et al., 2024; Kieanwatana & Vongvit, 2024).

In the context of exhibitions and conferences, VR is increasingly used to enhance participation and engagement. Activity-based VR experiences, in particular, have been shown to raise visitor involvement and satisfaction, suggesting that design quality and interactivity are central to successful implementation (Karnchanapayap, 2023). For the MICE sector, this implies that VR can move beyond marketing gimmicks to become a core component of immersive event delivery.

Hybrid and Virtual Event Models in the Post-Pandemic Era

The COVID-19 pandemic accelerated the uptake of digital platforms and established hybrid events as a mainstream format. Hybrid models allow physical events to retain in-person networking while extending accessibility through virtual channels. Sector reports and reviews published between 2023 and 2024 indicate that the pandemic acted as a catalyst, normalizing the integration of immersive technologies into event planning and execution (Singh & Deri, 2024). Studies on virtual and hybrid event formats emphasize resilience, inclusivity, and

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scalability as key advantages, suggesting that VR has a long-term role in complementing physical event delivery (Dariya, Babalola & Bashir, 2024).

Determinants of VR Adoption

A consistent theme across the literature is that adoption is not driven by technological availability alone, but by a combination of technology quality, organizational capability, and environmental support. Models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have been applied to understand individual attitudes toward VR. However, at the organizational level, the Technology-Organization-Environment (TOE) framework is especially useful because it captures broader systemic factors. Recent evidence underscores the relevance of TOE in emerging economies. Tran and Van Hanh (2025), integrating TOE and TAM, demonstrated that perceived usefulness and organizational ability are the strongest predictors of VR adoption intentions among firms, while policy incentives alone were insufficient unless supported by internal capabilities and compatible infrastructure. These findings reinforce the decision to adopt the TOE framework in this paper as a conceptual foundation for assessing readiness in the Malaysian MICE industry.

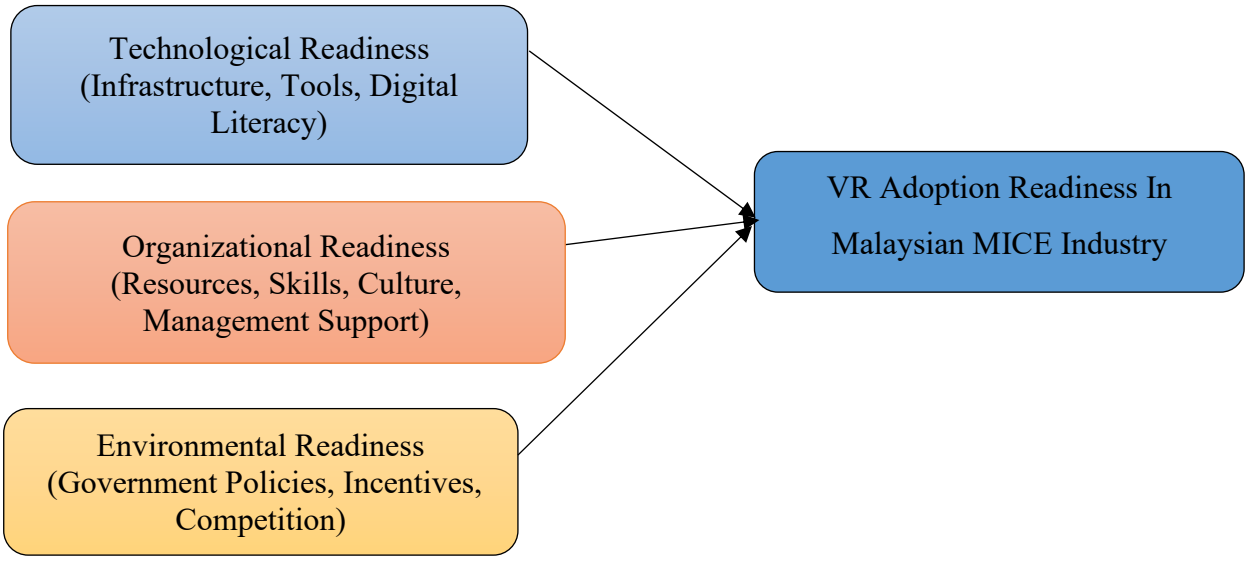

Figure 1: Proposed VR Readiness Framework for the Malaysian MICE Industry (TOE Model)

Malaysia's Policy Environment and Environmental Readiness

Malaysia's external environment offers a supportive backdrop for VR adoption. The Malaysia Digital Economy Blueprint (MyDIGITAL), launched in 2021, articulates national priorities in infrastructure development, cloud-first policies, digital talent building, and investment promotion (Government of Malaysia, 2021). Subsequent policy briefs highlight Malaysia's ambition to position itself as a regional digital hub (U.S. International Trade Administration, 2024). While these initiatives provide enabling conditions, challenges remain in ensuring regulatory clarity in areas such as data privacy, intellectual property protection in virtual environments, and quality standards for immersive content.

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Practical Lessons for MICE Stakeholders

Synthesizing recent findings, three lessons stand out for the MICE sector. First, content authenticity and interactivity are critical; poorly designed VR content risks undermining rather than enhancing participant engagement (Anaya-Sánchez et al., 2024; Kieanwatana & Vongvit, 2024). Second, the fit between use case and event type is decisive—VR applications are most effective when aligned with specific needs, such as venue previews, training simulations, or exhibition showcases (Karnchanapayap, 2023). Third, organizational capacity in terms of resources, leadership support, and staff training predicts sustained adoption. Without adequate skills and strategic alignment, even favorable technological and policy environments may not translate into long-term integration.

In summary, the literature indicates that VR holds significant potential for transforming the MICE industry but its successful adoption depends on more than technological novelty. Adoption is contingent upon organizational capacity and a supportive policy environment, dimensions that align with the TOE framework. By synthesizing these insights, this paper positions Malaysia's readiness for VR adoption as a multidimensional issue, shaped by the interaction of technology, organizations, and external environment.

Table 1: Recent Studies on VR in Tourism, Hospitality, and Business Events

Author(s) & Year	Context	Methodology	Key Findings	Relevance to MICE/VR Adoption
Calisto & Sarkar (2024)	Tourism & Hospitality	Systematic review (54 papers)	VR improves destination image, engagement, and booking intention; research gaps remain in design strategies.	Provides theoretical foundation for VR benefits and informs MICE applications.
Anaya-Sánchez et al. (2024)	Destination marketing	Survey/SEM	VR experiences enhance authenticity and enjoyment, which significantly increase visit intention.	Demonstrates VR's effectiveness for pre-event destination and venue marketing.
Kieanwatana, K. & Vongvit, R. (2024)	Tourism VR experiences	Experiment/Survey	Virtual experiences strongly influence travel intentions and satisfaction.	Highlights persuasive power of VR for event participation.

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Karnchanapayap (2023)	Exhibition engagement	Case/field study	Activity-based VR experiences increase visitor participation and engagement.	Evidence for designing interactive VR in exhibitions and conferences.
Tran & Van Hanh (2025)	VR adoption in firms (emerging economies)	PLS-SEM (260 firms)	Organizational ability and perceived usefulness are key adoption drivers; policy support alone is insufficient.	Supports TOE framework; emphasizes organizational readiness in adoption.
Singh & Deri (2024)	Event management post-COVID	Sector review	Technology catalyzed hybrid/virtual event models, improving resilience and inclusivity.	Contextualizes VR's role in hybrid MICE formats.
Dariya, Babalola & Bashir (2024)	Hybrid events	Industry study	Hybrid events expand reach and enhance accessibility.	Event planning is set to embrace a hybrid model that combines in-person attendance with online engagement.
Rahim et al. (2021)	Virtual tourism (Malaysia)	Literature review	COVID-19 accelerated use of virtual platforms for tourism promotion.	Provides local precedent for VR readiness in MICE.
Jidon et al. (2023)	Malaysian organizations	Survey	Leadership, innovation, and learning drive digital maturity.	Emphasizes organizational dimension of VR readiness.
Tee et al. (2024)	Graduate employability (Malaysia)	Employer survey	Digital skills gap among graduates constrains adoption of advanced technologies.	Underscores human capital challenges for MICE VR adoption.

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Methodology

This study adopts a mixed-methods conceptual design to propose a framework for assessing the readiness of Malaysia's Meetings, Incentives, Conventions, and Exhibitions (MICE) industry to implement Virtual Reality (VR). Because VR adoption involves both measurable indicators and contextual insights, a convergent mixed-methods approach is most appropriate. By combining quantitative surveys and qualitative interviews, this design ensures that statistical evidence is supported by rich, contextual perspectives from key stakeholders. Although this paper does not present empirical findings, the methodology is presented in detail to guide future research and provide academic rigor.

Research Design

The proposed research is structured around a convergent mixed-methods design, where quantitative and qualitative data would be collected in parallel and later integrated for interpretation. The quantitative survey is intended to provide generalizable insights into the extent of VR readiness, perceived benefits, and barriers among industry practitioners. Complementing this, the qualitative interviews are designed to capture in-depth perspectives from policymakers and technology providers regarding strategic, regulatory, and infrastructural issues. Together, these approaches allow for triangulation of results, thereby increasing validity and reliability (Guetterman, Fetters & Creswell, 2015).

Respondents and Sampling

Two main categories of respondents are identified. For the quantitative phase, the study would target event organizers, venue managers, professional conference organizers, and corporate clients. These stakeholders are selected because they are directly responsible for planning, financing, and executing business events, and therefore play a central role in determining the adoption of VR technologies. A sample size of approximately 200–300 respondents is proposed, which would be adequate for both descriptive and inferential statistical analysis.

For the qualitative phase, the respondents would consist of policymakers, industry leaders, and technology providers, including representatives from the Ministry of Tourism, Arts and Culture, the Malaysia Digital Economy Corporation (MDEC), and the Malaysia Convention & Exhibition Bureau. These participants are expected to provide deeper insights into regulatory frameworks, industry incentives, and national strategies supporting VR adoption. An estimated 15–20 interviewees are considered sufficient to achieve data saturation.

A purposive sampling strategy will be employed in both phases, ensuring that only participants with relevant experience and authority in the MICE sector are included. This is critical to capturing perspectives that directly reflect the realities of Malaysia's readiness to implement VR.

Research Instruments

Two primary instruments will be developed. The survey questionnaire will be structured based on the Technology-Organization-Environment (TOE) framework. It will include sections on technological readiness (infrastructure, VR tools, and digital literacy), organizational readiness (resources, leadership support, and innovation culture), and environmental readiness (government policies, industry incentives, and competitive pressure). Each item will be measured using a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

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For example, one item under technological readiness may state: "Our organization has the necessary infrastructure to implement VR for business events."

The semi-structured interview guide will complement the survey by providing qualitative depth. Questions will be designed around the TOE dimensions but kept flexible to allow interviewees to elaborate on unique experiences and insights. For instance, policymakers may be asked: "What policy mechanisms do you consider essential for enabling VR adoption in the Malaysian MICE sector?" This flexibility ensures that emergent themes beyond the TOE framework can also be captured.

Data Analysis

Quantitative data from the surveys would be analyzed using SPSS or SmartPLS. Descriptive statistics such as frequencies, means, and standard deviations would establish baseline readiness levels, while inferential techniques such as regression or Partial Least Squares Structural Equation Modelling (PLS-SEM) could test the relationships between TOE dimensions and VR adoption readiness. Reliability and validity would be established through Cronbach's alpha and factor analysis.

Qualitative data from the interviews would be transcribed and analyzed using thematic analysis. Coding would initially be guided by the TOE dimensions, but emergent categories would also be considered. This approach ensures both deductive and inductive rigor in the analysis. Software such as NVivo may be employed to assist in systematic coding and pattern identification.

Finally, the results from both phases would be triangulated to provide a holistic understanding of readiness. For example, survey findings indicating infrastructure gaps could be validated against interview insights from policymakers on national broadband strategies.

Research Process Flow

The overall research process can be conceptualized in eight sequential stages. It begins with a literature review, synthesizing existing studies on VR adoption in tourism and business events to identify gaps. Based on these insights, a conceptual framework grounded in the TOE model will be developed. Next, instruments such as the survey questionnaire and interview guide will be designed and subjected to pilot testing for refinement. This will be followed by data collection, with surveys distributed to industry practitioners and interviews conducted with policymakers and technology providers. The subsequent data analysis stage will involve both statistical and thematic techniques, after which the findings will be integrated and validated against the conceptual framework. Finally, the study will generate recommendations for policymakers, industry stakeholders, and academics.

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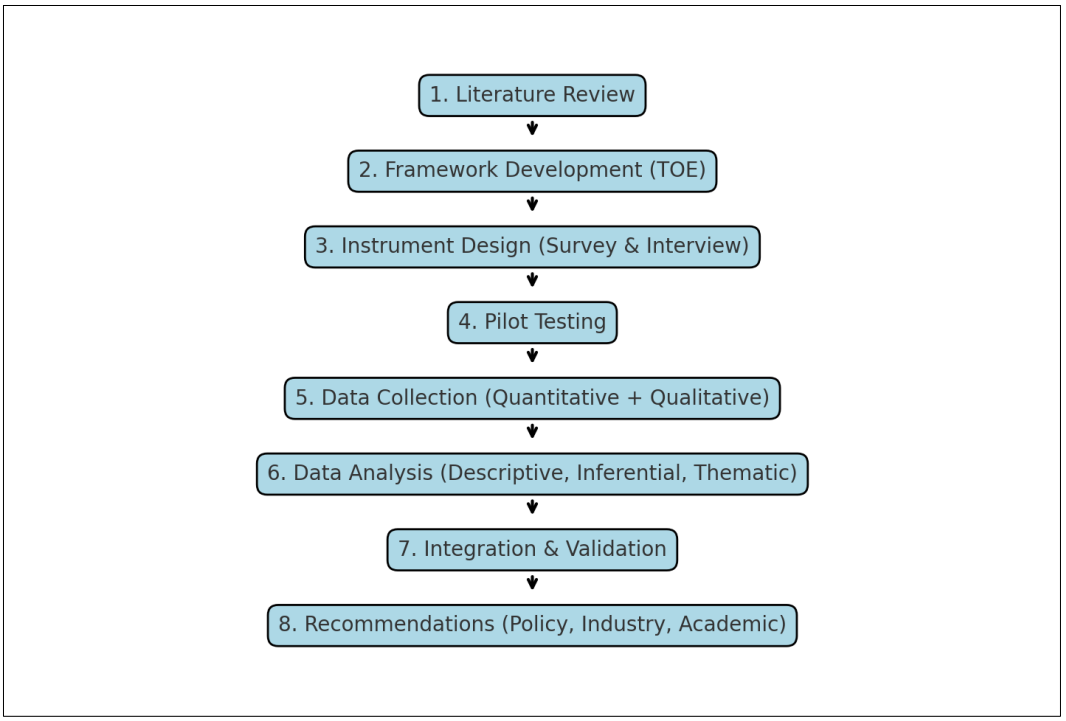

Figure 2: Propose Research Process Flow Chart

Results and Discussion

Although empirical data are not yet presented, this paper conceptually outlines the potential findings and implications of applying the proposed Technology-Organization-Environment (TOE)-based framework to assess Malaysia's readiness for Virtual Reality (VR) adoption in the MICE industry. The discussion is structured around three dimensions of readiness—technological, organizational, and environmental—and their anticipated contributions to both theory and practice.

Technological Readiness

Malaysia's digital infrastructure is expected to remain uneven across regions, with urban centers such as Kuala Lumpur and Penang demonstrating stronger readiness compared to smaller cities or rural areas. This reflects broader digital divides observed in other technology adoption studies (Tee et al., 2024). While high-speed internet penetration is steadily increasing, challenges such as limited access to advanced VR hardware and the high costs of implementation may restrict widespread adoption. Conceptually, this dimension highlights the importance of aligning infrastructural investment with the needs of the MICE sector to ensure inclusivity and scalability.

Organizational Readiness

From an organizational perspective, Malaysian MICE stakeholders are likely to demonstrate cautious interest in VR integration. Larger firms with greater financial and human resources may be more inclined to experiment with immersive technologies, whereas small and medium-sized enterprises (SMEs) could face barriers related to cost, training, and technical expertise. This unevenness has been observed in prior studies on digital transformation in Malaysia (Jidon et al., 2023). Organizational culture also plays a pivotal role; firms with innovative leadership and a willingness to adopt new practices may emerge as early adopters. Thus, the TOE

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framework anticipates a stratified landscape of readiness, where resource availability and leadership support act as key differentiators.

Environmental Readiness

The external environment presents both enablers and challenges. Strong government initiatives such as Industry 4WRD, the Malaysia Digital Economy Blueprint, and incentives from agencies like MDEC and MIDA provide a supportive policy framework. These efforts position Malaysia to compete with other Asia-Pacific MICE hubs that are already experimenting with hybrid and virtual events. However, regulatory clarity regarding data privacy, intellectual property rights in virtual environments, and content standards will be essential to fostering trust and sustaining adoption in the long term. The TOE framework suggests that environmental readiness may ultimately determine the pace of VR integration in Malaysia, given its reliance on national policy alignment and international competitiveness.

Positioning Malaysia in the Regional Context

By situating Malaysia's readiness within the broader Asia-Pacific landscape, the framework allows for comparative analysis with regional competitors such as Singapore, Thailand, and South Korea, which have already made significant strides in integrating VR into tourism and events. While Malaysia demonstrates strong policy intent, it may lag in infrastructure and organizational readiness if strategic interventions are not implemented. Nevertheless, with the right investments in skills and innovation, Malaysia could establish itself as a regional leader in VR-driven MICE activities, leveraging its geographic and cultural advantages.

Summary and Conclusions

This concept paper examined the readiness of Malaysia's Meetings, Incentives, Conventions, and Exhibitions (MICE) industry to adopt Virtual Reality (VR) technologies. By applying the Technology-Organization-Environment (TOE) framework, the study outlined three critical dimensions of readiness—technological, organizational, and environmental—that collectively determine the feasibility of VR integration in business events.

The paper achieved its objectives by:

Identifying Technological Enablers And Barriers

This study highlighted that while Malaysia has made progress in expanding broadband coverage and promoting digital transformation, technological readiness remains uneven. Urban hubs such as Kuala Lumpur and Penang benefit from more advanced infrastructure, while rural regions face slower connectivity and limited access to VR hardware. High equipment costs and insufficient locally developed VR content also limit adoption. Nevertheless, growing digital penetration and increased awareness of VR applications act as important enablers.

Highlighting Organizational Readiness Factors

Organizational readiness was found to vary significantly depending on firm size, leadership orientation, and available resources. Larger event organizers and multinational firms with established innovation cultures are more likely to experiment with VR, while small and medium-sized enterprises (SMEs) face challenges due to limited technical expertise, funding constraints, and risk aversion. This highlights the importance of targeted training and financial support to level the playing field across organizations of different capacities.

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Analyzing Environmental Influences

Malaysia's policy environment, shaped by initiatives such as Industry 4WRD and the Malaysia Digital Economy Blueprint, provides a supportive foundation for VR adoption. Government-linked agencies such as MDEC and MIDA are actively promoting digital adoption. However, regulatory clarity remains limited, especially in areas such as intellectual property protection in virtual spaces, data security, and content standards. Regional competition from countries like Singapore and South Korea further emphasizes the urgency for Malaysia to refine its regulatory frameworks and strengthen its international competitiveness.

Proposing A Conceptual Framework For Assessing VR Readiness

This paper advances the TOE framework by adapting it specifically to the Malaysian MICE industry. The conceptual framework integrates technological, organizational, and environmental dimensions into a holistic model for assessing readiness. This not only addresses a gap in the academic literature on VR adoption in emerging economies but also offers policymakers and industry practitioners a structured tool to evaluate readiness, identify gaps, and prioritize interventions. The framework lays the foundation for future empirical validation, making it both theoretically significant and practically relevant.

Theoretical Contributions

This paper contributes to scholarship by extending the TOE framework into the underexplored context of VR adoption in the MICE industry within an emerging economy. It shows that readiness is multidimensional, shaped not only by technological capability but also by organizational dynamics and external policy environments. By conceptualizing these dimensions in an integrated framework, this paper provides a theoretical basis for future empirical studies and comparative analyses across countries.

Practical Contributions

Practically, this paper offers a roadmap for stakeholders in Malaysia's MICE industry. For policymakers, it identifies priority areas such as strengthening broadband infrastructure, providing fiscal incentives, and clarifying regulatory standards for VR applications. For industry practitioners, it highlights the need to build internal capacity through workforce training, strategic investments, and collaborations with VR technology providers. For academia, it underscores the importance of embedding digital literacy and immersive technology competencies into education curricula to prepare graduates for future industry demands.

Recommendations

To accelerate VR adoption in Malaysia's MICE sector, the following recommendations are proposed:

Strengthen Infrastructure Investment

Expand nationwide broadband coverage and ensure equitable access to high-speed internet, particularly in secondary cities and rural regions. At the same time, introduce subsidies or public-private partnerships to reduce the cost of VR hardware and software for event organizers.

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Enhance Capacity Building and Skills Development

Develop specialized training programs in VR content creation, platform management, and immersive event design. Universities and vocational institutions should integrate VR-related skills into hospitality, business, and IT curricula. Continuous professional development programs for event practitioners can also bridge the digital skills gap.

Introduce Policy Support and Incentives

The government should provide fiscal incentives, such as tax rebates and innovation grants, to organizations experimenting with VR in business events. Establishing clear regulatory guidelines on data protection, intellectual property rights, and quality standards for VR applications would also build confidence among industry players.

Foster a Collaborative Ecosystem

Promote partnerships between government agencies, event organizers, technology providers, and industry associations to pilot VR-enabled events. Such collaborations can demonstrate best practices, reduce uncertainty, and encourage broader adoption. Knowledge-sharing platforms and industry conferences should also highlight VR success stories to inspire adoption.

Integrate Sustainability Goals

VR should be positioned as part of Malaysia's sustainability agenda by reducing the environmental impact of large-scale events. Hybrid and virtual formats can reduce travel-related carbon emissions while maintaining inclusivity and accessibility. Aligning VR adoption with global sustainability commitments will also enhance Malaysia's attractiveness as a responsible MICE destination.

In conclusion, Malaysia's readiness for VR adoption in business events is partial yet promising, contingent upon strategic investments, organizational support, and enabling policy measures. Strategic investments in infrastructure, targeted organizational support, and enabling policy measures are required to accelerate adoption. This paper therefore makes a dual contribution: theoretically, by extending the TOE framework into the context of VR adoption in the MICE industry of an emerging economy; and practically, by offering a roadmap for policymakers, industry practitioners, and academics to strengthen Malaysia's position in the increasingly competitive global MICE landscape.

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